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ABSTRACT

The Koppitz Minibattery, that is, the Bender Gestalt Test, the Visual Aural Digit Span Test (VADS), and the Human Figure Drawing (HFD), was adopted and extended for use with middle school pupils (aged 11 to 14). Similarities and differences for older and younger children are described in behavior observation, objective scores and the qualitative analysis on the three measures. Research data are presented to show how the Bender, VADS and HFD supplement each other. Case histories illustrate how the information derived from the three tests can be integrated and applied for individual students. (Author/PN)

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Assessing Secondary Students with the Bender, VADS, and HFD: Research and Application.

Elizabeth M. Koppitz, Ph.D.

Many tests are available for the diagnosis and screening of young children with learning and behavior problems. Unfortunately learning and behavior problems do not just disappear, most of them continue to be in evidence as children get older. There remains a big need for diagnostic instruments for secondary pupils. Relatively few tests are available for adolescents who are no longer young children and not yet adults. During the past couple of years I have devoted my efforts to the adaptation and extension of the Koppitz Minibattery, that is,the Bender Gestalt Test, the Visual Aural Digit Span Test or VADS Test, and Human Figure Drawing or HFD, for use with middle school pupils, age 11 to 14. A great deal of information can be derived from these three brief paper and pencil tests by means of multiple test analysis, even though the administration of the Minibattery takes only ca.20 minutes.

As I see it, tests are just tools. It is wasteful to use a separate tool for each task when one tool can serve several functions. Anyone who uses a psychological test and derives nothing from it but a single test score is cheating him- or herself and is wasting time and effort. I always look for at least three different kinds of data and information when I evaluate students with a psychological test:

1. *<u>Observation of children's behavior</u> during test administration reveals their attitudes, inner control and cognitive strategies.*

2. *<u>Objective scores</u> can be compared with normative data and with youngster's own previous scores to assess their level of functioning and progress.*

3. *<u>Qualitative analysis of test protocols and comments</u> can show the pupils' attitudes, selfconcepts, and concerns as well as signs of neurological differences or impairment.*

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The diagnostic usefulness of the Bender, VADS and HFD for elementary school pupils has been extensively documented (Koppitz 1963,1968,1975,1977). The question is, how useful is the Minibattery for secondary students? My recent research was designed to provide some answers to this question. First, I want to point out the similarities and differences in analyzing the Bender, VADS and HFD performances of elementary and middle school students; then I will give some research data to show the validity of the tests for groups of pupils, and finally I want to present two case histories to show how the Minibattery can be used as a multifaceted, meaningful diagnostic screening instrument and as a valuable supplement in a comprehensive psychological evaluation.

The Bender Gestalt Test.

The Bender Test needs no introduction. As you know, the Bender Test requires that the child copy nine designs onto a blank sheet of paper. The Bender Test in not primarily a test of visual perception or a test of motor coordination, it is rather a test of perceptual-motor integration, the emphasis is on integration. Perceptual-motor integration improves gradually in children age 5 to 10, due to maturation and learning. Most fifth-graders can copy the Bender Test figures easily without errors. Consequently the Bender Test ceases to be a developmental test for middle school pupils, and the method of analyzing the Bender Test performance of secondary pupils differs slighly from that of younger children.

1. Behavior Observation of students copying the Bender Test designs is possibly even more revealing for older than for younger children. The length of time pupils need to complete the test reflects impulsivity or excessive slowness; the way youngsters go about drawing the figures may reveal attempts to compensate for underlying difficulties in perceptual-motor integration; spontaneous efforts to correct imperfections or errors on the Bender Test may show an awareness, perfectionism, rigidity, or low frustration tolerance;

behavior can also reveal distractibility and a short attention span. All these factors and kinds of behavior are related to the children's behavior and functioning in the class room.

2. Objective scores on the Bender Test are developmental scores. Once a child's perceptual-motor integration has matured, the Developmental score of 0 or 1 cannot be improved any further. Bender Test scores can only differentiate between middle school students whose perceptual-motor integration is at or below the 10-year level; they cannot differentiate between older pupils whose scores are average or above average. Therefore, the Bender Test score is only meaningful for middle school pupils who have a serious developmental lag or malfunctioning in perceptual-motor integration, that is, whose Bender Test score is below the 10-year level.

3. Qualitative analysis of Bender Test protocols by means of the 12 Emotional Indicators is valid for both younger and older pupils even though the clinical significance of the individual Emotional Indicator varies somewhat for elementary and secondary students. The Emotional Indicators are not scores and should not be added up. They are clinical signs and each one should be analyzed separately. The Emotional Indicators reflect underlying attitudes and tendencies. Of particular importance for older children is the organization of the Bender Test designs on the paper. Poor planning or lack of organization on the Bender Test protocol is associated with lack of planning and organization in school work. In addition to the 12 Emotional Indicators I have been impressed that the occurrence of Collision, the overlap of two figures, is related to acting-out behavior in older pupils.

Taken together, the three ways of analyzing the Bender Test performance of middle school pupils are able to give some information about a youngster's inner control, impulsivity, organization, underlying problems in perceptual-motor integration and the ability to compensate for shortcomings. The Bender Test performance is related to the overall functioning and to arithmetic of

6th to 8th graders, it is not specifically related to reading and writing.

The Visual Aural Digit Span Test (VADS)

The VADS Test is a test of sound-symbol integration, sequencing and recall. It was specifically designed as a diagnostic test for problems in reading recognition and spelling. Reading recognition and spelling depend to a large extent on visual recall of symbol-sound sequences. The VADS Test requires that children reproduce both orally and in writing digit sequences, that they both hear and see. The standard VADS Test for elementary school pupils includes digit series with two to seven digits. The VADS Test was extended for use with middle school students to include also eight-digit sequences. New normative data for 6th, 7th, and 8th graders and for 11, 12, 13, and 14 year olds have been developed. The extended VADS Test can be analyzed in the same way as the standard VADS Test.

1. Behavior observation of pupils taking the VADS Test can reveal their recall strategies (grouping, rehearsal of digits), impulsivity (difficulty waiting 10 seconds before repeating digits), frustration tolerance, and the kinds of errors they make (transposition of digits, omissions, lost endings etc.) This kind of information is useful in making specific recommendations to teachers or in writing a child's IEP.

2. VADS Test scores are determined by the longest digit sequences a child reproduces without errors. Normative data show the expected functioning level of children. The scores can reveal a pupil's preferred mode of processing and recall (oral vs. visual). Of particular diagnostic significance are the Total VADS score, the Visual-Oral score, and the Visual Memory score, these correlate well with reading recognition and spelling scores and differentiate between pupils with and without learning disabilities.

3. Qualitative analysis of the VADS Test record is mainly concerned with the size, evenness, and organization of the written digit sequences. A protocol may reveal immaturity, a lack of planning, impulsivity, carelessness, and act-

ing-out tendencies. The clinical significance of an immature or disorganized VADS Test record increases as the students gets older.

Taken together, the analysis of the VADS Test for middle school pupils gives information about the pupils' preferred modes of processing and recall, their impulsivity and organization, and about specific problems with reading recognition and spelling due to problems with sound-symbol integration and memory deficits.

Human Figure Drawing.

HFDs, as defined here, are obtainded from children in response to the instruction to "draw one whole person." Stick figures are not accepted. The nature of HFDs differs markedly for elementary and secondary students. Drawing is a natural mode of expression for young children but not for middle school pupils. Seventh and eighth graders draw often cartoon figures or stereotypes that have limited projective value. Many teenagers do not enjoy drawing because they are selfconscious and consider their productions unsatisfactory. Some youngsters even refuse to draw and should not be forced to do so. Three groups of adolescents continue to enjoy drawing people: the artistically gifted, the very immature and youngsters with serious emotional problems. If a HFD is willingly made by a middle school pupil, it can be very revealing diagnostically. HFDs, again, are analyzed in different ways:

1. Observation of pupils while they are making a HFD often yields information that cannot be obtainded from the finished drawing. The sequence in which the figure is drawn is important. Youngsters who draw the feet of the person first tend to have difficulty with interpersonal relationships. Sometimes important details of drawings are later shaded or erased, or the gender and age of the person drawn may be changed as the youngster is working on the HFD. Difficulty in drawing a chosen person, or part of the person, reflects the youngster's anxiety or conflict with that person or body part.

2. Objective scores on HFD are developmental scores and correlate well with mental maturity and IQ scores of elementary school students. The HFD is no longer a developmental test for middle school pupils, therefore, objective scores have limited value for older students.

3. Qualitative analysis of HFDs is equally significant for younger and older children. The 30 Emotional Indicators on HFDs, developed for elementary school pupils, are also appropriate for older students, but the diagnostic value of each Emotional Indicator for middle school pupils has to be further explored. Emotional Indicators are not scores, but clinical signs. Recent research indicated that 12 Organic Signs on HFDs are of particular value in identifying older students with learning problems. The 12 Organic Signs are a combination of Developmental and Emotional Indicators that occurred significantly more often but not exclusively on the HFDs of boys, age 11, who were medically diagnosed as being neurologically impaired. A single Organic Sign is of little importance, but two or more Organic Signs suggest Minimal Brain Differences, neurological immaturity or malfunctioning.

HFDs can also be analyzed for content. After the youngster completes the HFD I ask: "Is this person someone you know or someone you made up?" "How old is this person?" "What is this person doing or thinking?" The person children draw is usually the person they are most concerned with; the answers to these questions tend to reflect pupils' selfconcepts, anxieties, conflicts, wishes, and ways of dealing with problems.

Taken together, the different ways of analyzing HFDs can reveal selfconcepts, interpersonal relationships, underlying attitudes, anxieties and concerns, and the mental maturity of teenagers. HFDs are not appropriate for all middle school pupils since some older children are too selfconscious and may refuse to draw. For these youngsters the drawing of a tree or a verbal projective test may be more productive than a HFD.

Bender, VADS, and HFD: Research

The following is a summary of a recent study which I conducted with groups of learning disabled special class pupils and with regular 6th grade students. The groups were matched for social background, ethnic composition, age, sex, and IQ, all Ss were of average mental ability. Table 1 shows the description of the groups and the Chi-square results comparing the special class pupils and the Controls on the Bender Test Development score, the Bender Test Emotional Indicators, the Total VADS Test score, the HFD Emotional Indicators and the Organic Signs on the HFD. All five measures were able to differentiate between the two groups of Ss. However, there was no simple one-to-one relationship between any of the five measures and learning and behavior problems. Individuals in both the special class and the control groups had some difficulty with the measures, although the special class youngsters showed a greater frequency of and more severe problems. The special class pupils typically presented both learning and emotional problems and did poorly on several of the measures on the Minibattery.

Table 1 shows that 93% of the LD Ss had difficulty on 2 or more measures on the Bender VADS and HFD; 82% had difficulty on 3 or more measures; 50% had problems on 4 of the measures, and 18% did poorly on all five measures. In the control group three youngsters also did poorly on 4 of the 5 measures; all three have since been referred to special classes.

It was possible to divide the special class youngsters into two groups on the basis of their behaviors as described by their teachers. The ED/LD youngsters were said to be disruptive, acting-out and had serious emotional problems; while the LD group was said to be better controlled, more conforming and less disturbed. A t-test showed no significnat difference in academic achievement between the ED/LD and the LD subgroups. Table 2 shows the comparison of the ED/LD and LD groups on the 5 measures of the Minibattery. The Bender Test Developmental score ($p < .05$), the Bender Emotional Indicators ($p < .05$) and the Emotional Indicators on the HFD ($p < .001$) were able to differentiate significantly between the

two groups of pupils. Twenty-one of the 22 ED/LD Ss displayed 2 or more Emotional Indicators on their HFDs compared to 8 Ss in the LD group. No differences were found on the Total VADS Test score and on the Organic Signs on the HFDs; both groups did equally poorly on these two measures. It is hypothesized that both the ED/LD and the LD youngsters had serious learning disabilities based on underlying Minimal Brain Differences or neurological impairment. The ED/LD Ss had in addition poor inner control and serious secondary emotional problems, while the LD Ss had better inner control and were less impulsive.

Research data refer to groups of children but psychologists assess individual youngsters not groups of pupils. Let me present now two case histories to demonstrate how the Bender, VADS and HFD can be used with individual middle school pupils.

Christopher, age 12 years, 4 months, was referred for psychological evaluation by his teacher who considered him misplaced in her class. Academically Chris functioned on the third grade level; socially he was an isolate and not well liked by his peers. His teacher reported that Chris did not appear to be dull, he was alert and verbal. I found Chris to be a small, immature, articulate, highly motivated youngster who was very cooperative during the testing session. He seemed eager for attention and recognition.

The Bender Test protocol Chris produced was nearly perfect.. The designs were carefully drawn and neatly arranged along the left hand margin of the paper. The Bender Test protocol hardly looks like that of a child with serious difficulties in school. Yet, observation of Chris while he was copying the figures told a different story. Chris worked extremely slowly, giving himself verbal instructions as he drew, muttering to himself: "It has to be perfect, it has to be perfect." It took Chris 20 minutes to complete the Bender Test, most children finish it in 6 minutes. Drawing was neither easy nor automatic for Chris. The way he went about copying the designs suggested that he had difficulties in the past with organization and perceptual-motor inte-

gration, and that he had learned to compensate for these difficulties by working very slowly and by arranging the Bender Test figures rigidly along the outer edge of the paper. These efforts show good intelligence. In addition, Chris revealed much perfectionism. He erased and redrew each figure two or three times. Chris set very high standards for himself. It was apparent from his Bender Test that Chris had to work slowly and that he was unable to work under pressure, hence he was unable to function in a large group or in a regular class room.

Chris' approach to the VADS Test was also intelligent: He grouped and rehearsed digits as he tried to recall them. His written VADS Test record is neat. The digit sequences are lined up along the edge of the paper. Once again, Chris is telling us that he needs outer limits and control since his inner control is weak. His VADS Test scores show a wide discrepancy: His oral recall of auditory digit sequences was average (50.percentile) for his age level. Chris is an auditory learner. By contrast his visual recall reached only the 5. percentile; his visual-oral integration was below the 5. percentile for 12 year olds. Chris' Total VADS Test score was at the 5. percentile and resembled those of 8-year old children. This corresponded to his achievement level.

The HFD represents Chris himself and his dog. Observation of Chris while he was making the HFD proved as significant as the finished figure. Chris began by drawing the baseline and the feet. He erased and redrew each foot stating that they had to be exactly the same length. Once again Chris showed the need to verbalize and to give himself verbal instructions as he worked, and again he displayed a great deal of perfectionsm. The sequence in which he produced the HFD reflects his difficulties with interpersonal relationships. He had no friends, his favorite "person" was his dog. The details of the HFD indicated that Chris was of at least average mental ability.

Looking at Chris' performance on the Bender, VADS and HFD together, we can conclude the following: Chris is a verbal youngster of at least average mental

ability who has serious learning and emotional problems. Chris learns best when given verbal instructions and when he can verbalize to himself what he sees and reads. Chris has specific problems with symbol-sound association, perceptual-motor integration, and above all, with visual memory for symbol sequences, facts and figures, all of which greatly interfere with his achievement. Chris is also impulsive, poorly organized and has poor inner controls, but he has learned to compensate for these weaknesses by working very slowly and using rigid control in his work.. He cannot work well under pressure or when hurried, he needs firm limits and much support. He is highly motivated to achieve but has set unrealistically high standards for himself. He strives to please adults and wants to be perfect. His prefectionism and rigidity set him apart from his peers. He is a social isolate who relates best to his dog.

Based on this information I recommended that his teachers encourage Chris to verbalize to himself when reading and writing and that Chris be given as much time as needed to complete his work so he could compensate for his difficulties. He also needed help in setting more realistic goals for himself and to relate better to peers.

In closing I would like to present Andrea, age 11 years, 8 months, who was referred for psychological evaluation after she was expelled from a 6th grade class of a private school because of aggressive and defiant behavior and refusal to do any work. I found Andrea to be an unhappy, pretty but obese youngster who was starved for attention and affection. She was very cooperative during the testing session and responded well to encouragement and praise.

Andrea's performance on the Bender Test was most revealing. She worked fast but then announced: " That is not the best I can do, I will do it over again." She abandoned Figures A, 4 and 8 and redrew them several times without really improving the quality of the drawings. Clearly copying designs was difficult for Andrea. She was aware of her poor perfromance but was too impulsive to carefully erase and correct the figures, instead she just quit

a design when she was dissatisfied and started over again in order to please the examiner. In school Andrea apparently also gave up when an assignment was hard for her, and she did nothing at all when she was on her own without an adult at her side. Poor organization and collision on the Bender record reflected Andrea's impulsivity, lack of planning and acting-out tendencies. The protocol showed that she had poor inner control as well as emotional problems. Andrea's Developmental Bender Test score of 5 fell below the 5. percentile for 11-year olds and resembled those of 7 1/2-year olds. Her immaturity in perceptual-motor integration had most likely a neurological basis and accounted for her serious problems with arithmetic.

Andrea's performance on the VADS Test was weak but still within the normal range for her age level. Her Total VADS Test score was at the 38.percentile and resembled those of 10-year old students, which corresponded to her level of reading recognition and spelling on the Wide Range Achievement Test. Andrea's VADS Test record showed a low frustration tolerance and poor inner control. She impulsively crossed out digit sequences when she anticipated failure, and she drew a box around the digits thereby revealing her need for outer limits and structure.

Andrea's HFD was highly significant. She began by drawing the square body with breasts, thus showing her anxiety and concern about her large, fully developed body and her difficulty with interpersoanl relationships. She said: " It's a girl Frankenstein, 16 years old." The HFD reveals her poor selfconcept; she thought of herself as being not quite human. She was unhappy with the present and wished she were older and independent. The presence of six Organic Signs on the drawing suggests underlying neurological impairment.

Taken together, the information from the Bender, VADS and HFD indicate that Andrea is of at least low average mental ability and that she has both learning and emotional problems. Her poor inner control, impulsivity, lack of organization, low frustration tolerance, and immature perceptual-motor integration ap-

pear to have a neurological basis. They grossly interfere with her ability to cope with the demands of a regular class room. Even at best, Andrea has difficulty keeping up with 6th grade work, her reading and writing are at the 5th grade level while her arithmetic is only at the 3rd to 4th grade level. When faced with failure Andrea gives up, when pushed she gets aggressive or defiant. But Andrea is starved for attention and recognition, she responds well to praise and support. Andrea is very sensitive about the obesity, her self-concept is extremely low. She has difficulty getting along with peers. Andrea needs a small, highly structured, supportive learning disability class where she can work at her own level and experience success. She also needs counseling to help her to improve her inner control, selfconcept and frustration tolerance.

The examples of Chris and Andrea illustrate the amount and variety of information that can be derived from the Minibattery with middle school pupils.

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TABLE 1

COMPARISON OF MATCHED GROUPS OF LEARNING DISABLED PUPILS (N=44) AND REGULAR 6th GRADERS (N=44) ON THE BENDER, VADS, AND HFD.*

Test	Chi-square	p
A. Bender Developmental Score	6.63	.01
B. Bender Emotional Indicators	7.94	.01
C. Total VADS Test Score	25.36	.001
D. HFD Emotional Indicators	6.32	.01
E. HFD Organic Signs	8.44	.01
A,B,C,D, and E combined	24.24	.001

POOR PERFORMANCE ON FIVE MEASURES OF THE BENDER, VADS, AND HFD.

Number of measures	LD (N=44)		Controls (N=44)	
	N	%	N	%
0	0	0	6	14
1	3	7	16	36
2	5	11	10	23
3	14	32	9	20
4	14	32	3	7
5	8	18	0	0
	44	100	44	100

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* LD and Control Groups came from the same socio-economic background and were matched for age (C.A.mean 11-7, age range 10-2 to 12-8), sex (male 32, female 12), and ethnic grouping (77% white, 16% black, 7% hispanic); the LD pupils had a mean WISC-R IQ of 102 (IQ-range 91 to 121), the Control Ss were of at least average mental ability according to teacher estimates, no IQ-data were available for this group.

TABLE 2

COMPARISON OF LEARNING DISABLED PUPILS WITH (ED/LD N=22) AND WITHOUT (LD N=22) SERIOUS EMOTIONAL AND BEHAVIOR PROBLEMS ON THE BENDER, VADS, AND HFD.

Test	*Chi-square*	*p*
A. Bender Development Score	*3.93*	*.05*
B. Bender Emotional Indicators	*3.33*	*.05*
C. Total VADS Test Score	*not significant*	
D. HFD Emotional Indicators	*12.59*	*.001*
E. HFD Organic Signs	*not significant*	